DOCUMENT RESUME

ED 458 616 CS 217 739

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TITLE Conceptualizations Underlying Emergent Readers' Story Writing. CIERA Report.

INSTITUTION Center for the Improvement of Early Reading Achievement, Ann Arbor, MI.

SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.

REPORT NO CIERA-R-2-015

PUB DATE 2001-11-05

NOTE 22p.

CONTRACT R305R70004

AVAILABLE FROM CIERA/University of Michigan, 610 E. University Ave., 1600 SEB, Ann Arbor, MI 48109-1259. Web site: http://www.ciera.org.

PUB TYPE Reports - Research (143)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS *Beginning Writing; Case Studies; *Childrens Writing; *Emergent Literacy; Foreign Countries; Invented Spelling; Kindergarten; Kindergarten Children; Primary Education; Writing Research

IDENTIFIERS Multiple Case Study Approach; *Netherlands; *Story Writing

ABSTRACT

Two series of case studies were carried out following a multiple baseline design across individuals. The first series of eight studies included 4- to 5-year-old Dutch kindergarten children, and the second series examined 5- to 6-year-old kindergarten children. Each child wrote approximately 16 stories in the natural classroom environment over a 2-month period. During the last month of the experiment the teacher or a researcher promoted invented spelling by modeling this strategy for the children prior to their second series of writing sessions. The two series of case studies tested how children harmonized knowledge and understandings, represented by early-developing forms of writing such as random letter strings or pseudo-cursive scribbles, with an emerging understanding that letters represent sounds. Even when children understood the alphabetic principle and adults promoted the use of letter-sound rules to represent their story, children were not inclined simply to drop early-developing forms such as pseudo-cursive scribble or random letter strings. They often produced combinations of early forms and invented spelling. Invented spelling gradually increased over earlier forms, but only among a group of older kindergartners. Contains 4 tables, 3 figures, and 24 references. (Author/NKA)

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Conceptualizations Underlying Emergent Readers' Story Writing

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CIERA REPORT #2-015
November 5, 2001

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CIERA Inquiry 2: Home and School
What roles do various types of knowledge play when children are instructed to compose written stories?

Two series of case studies were carried out following a multiple base-line design across individuals. The first series of eight studies included 4- to 5-year-old Dutch kindergarten children, and the second series examined 5- to 6-year-olds. Each child wrote approximately 16 stories in the natural environment of their classroom over a two-month period. During the last month of the experiment the a teacher or researcher promoted invented spelling by modeling this strategy for the children prior to their second series of writing sessions. The 2 series of case studies tested how children harmonized knowledge and understandings, represented by early-developing forms of writing such as random letter strings or pseudo-cursive scribbles, with an emerging understanding that letters represent sounds. Even when children understood the alphabetic principle and adults promoted the use of letter-sound rules to represent their story, children were not inclined simply to drop early-developing forms such as pseudo-cursive scribble or random letter strings. They often produced combinations of early forms and invented spelling. Invented spelling gradually increased over earlier forms, but only among a group of older kindergartners.

Center for the Improvement of Early Reading Achievement
University of Michigan – Ann Arbor

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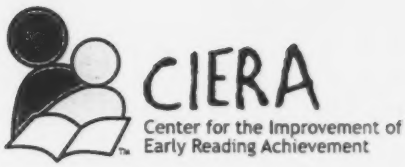

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This research was supported by the Center for the Improvement of Early Reading Achievement (CIERA). The study described herein was funded under the Educational Research and Development Centers Program, PR/ Award Number R305R70004, as administered by the Office of Educational Research and Improvement, U.S. Department of Education. However, the contents of the described report do not necessarily represent the positions or policies of the National Institute on Student Achievement, Curriculum, and Assessment; the National Institute on Early Childhood Development; or the U.S. Department of Education. You should not assume endorsement by the Federal government.

Conceptualizations Underlying Emergent Readers' Story Writing

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Children develop knowledge of the writing system from an early age, as they move through a sequence of forms: pseudo-cursive, random strings of letters or pseudo-letters, phonetic and formalized writings (Ferreiro & Teberosky, 1982; Read, 1971). If this sequence is a stage-like hierarchy, it would mean that children discard early-appearing forms such as pseudo-cursive scribble, random letter strings, and strings of pseudo-letters in favor of more advanced, later-appearing forms such as invented and formalized spelling (Levin & Bus, in prep.). Research so far does not support such a developmental model. Some studies suggest that as new forms are added to their repertoire, children employ both late- and early-appearing forms of writing side by side, often showing a preference for the early-appearing forms even when later-appearing forms are clearly available (Bialystok, 1995; Neuman & Roskos, 1993; Sulzby, Barnhart, & Hieshima, 1989). Particularly when children are pursuing more complex tasks such as communicating a message (versus offering single words), they may be more inclined to prefer early-developing forms of writing above more advanced invented or conventional (formalized) spellings (Kamberelis, 1992). In a recent study of kindergartners by Borzone de Manriques and Signorini (1998) the predominant form for writing words indeed was conventional spelling, whereas the predominant form for text writing was letter strings, often made up of a small selection of letters.

These findings suggest that children use their knowledge about writing as a repertoire, moving back and forth across various forms of writing (Sulzby, 1989). Despite their emerging ability to produce text that is somewhat readable, children seem inclined to continue forms of writing that do not represent sound. Early-appearing forms may have a supplemental value for young children because these forms represent aspects of text which their invented

spelling cannot address. When children represent just a few sounds of the text they have in mind, the result may contradict other notions characteristic of early-appearing forms of writing, such as the need for concordance between the length of written and spoken text (Levin & Bus, submitted). Furthermore, young emerging writers may not acknowledge the surplus value of invented spelling because they do not use written text as a main source of information when they read. When re-reading their own stories emerging writers often retreat to the story that they had in mind when they wrote the text, instead of making attempts to decode their invented or conventional (formalized) spelling.

In this view one may expect that kindergartners often *prefer* early-appearing forms of writing such as pseudo-cursive scribble or random letter strings for representing a story over invented spelling, as long as their various sources of knowledge are neither sufficiently well-formed nor sufficiently integrated to work together fluidly and flexibly on the difficult task of composing a story (Kamberelis, 1992). It is not until they are more fluent in the production of phonetic writing, and the outcome of writing invented spelling is becoming more text-like, that early-appearing forms may fade away in favor of invented spelling.

Sulzby and colleagues have reported various proportions of random letter strings or pseudo-cursive writings in the productions of children who were clearly attempting to write text phonetically (Sulzby, 1989; Sulzby et al., 1989). Instead of selecting one form of writing exclusively, these children seem to alternate between phonetic and early-appearing writing approaches in the same product. We hypothesize that such mixed forms appear when children are reminded of the representative function of text before the writing session. Children with an emerging understanding of the alphabetic principle may then try to comply with the request to represent sounds. However, they often retain some early-appearing forms, too, in order to produce a product with early-appearing characteristics such as concordance between the amount of oral and written language.

The purpose of the present study is to understand how various types of knowledge may come to play a concurrent role when children are instructed to compose written stories. If children use various strategies as a repertoire, rather than as stages in a hierarchy, then we should expect that they would use early-appearing forms of writing well into the phase when they are beginning to apply the alphabetic principle. Until their various knowledge sources are sufficiently well-formed and integrated, they may not discard early-appearing forms in favor of phonetic writing. Even when adults promote the next step in development (invented spelling), children may continue to prefer early forms above invented spelling or create mixtures of the two.

This study

In focusing on forms of writing we investigated how young children create and/or transmit a complicated message in a written format (e.g., Clay, 1975; Ferreiro & Teberosky, 1982; Levin & Bus, in prep.; Tolchinsky-Landsmann &

Levin, 1985). A series of case studies was carried out over a two-month period. During this period each child wrote approximately 16 stories under similar conditions. To explore the effect on children's strategies of promoting invented spelling before the writing session, the sessions were divided into two series of eight sessions. During the first series (the baseline stage) no special instructions were given, apart from the request to write a story about a topic of their own choice. Similar to Sulzby's (1989) procedure, common forms of writing (i.e., pseudo-cursive scribble, random letter strings, invented spelling, and conventional spelling) were modeled as legitimate forms that "some children use," before the children started to write their stories. Children were instructed to write "their own way." Questions about letters ("how goes ss?") were honored by direct, short answers, but requests to model writing of words or sentences were declined.

During the second series of eight sessions (the intervention), children were encouraged to use their phonetic-based, alphabetic knowledge. Preceding the first session of this second phase the examiner modeled invented spelling while explaining: "Write the letters that you hear in the words." When a child did not start to use phonetic knowledge but the teacher had the impression that the child was aware that letters represented sounds in words, the request was repeated in follow-up sessions. By describing children's development over these two phases, we were able to explore the effects of an intervention designed to promote the production of invented spelling on forms of writing.

Study I

Method

Subjects. Eight four- to five-year-old children (mean age: 66 months, range: 64–70 months) with moderate emergent writing skills were selected from two Dutch schools. The groups were quite large (about 30 children each). In both classrooms a typical Dutch instructional program was followed, which involved a rather low level of structure and an emphasis on social and aesthetic development in play. As in most Dutch kindergartens, the formal teaching of reading or writing, including instruction on letters, was not part of the curriculum. Both schools recruited children from low-SES families. Most mothers in these families were housewives, while the husbands were mainly manual laborers working for building contractors or in stores.

The eight subjects were randomly selected from among a group of children who were able to write their names and who knew some letters. About half of the children in both classrooms met these minimum criteria. The eight children's ability to name letters on letter cards varied considerably, with a mean of 7 out of 26 (SD = 5.1). Two children produced invented spelling for two or three out of nine dictated words. These children spontaneously represented some sounds, e.g., S for ZON (sun). The rest used only forms of

writing such as pseudo-cursive scribble and strings of letters or pseudo-letters. Three of the eight children were boys.

Design. These children wrote stories about twice a week over the course of two months, in a special corner of their classroom. Apart from these sessions writing was not stimulated by the teacher. Each session took about 15 minutes. On average the children produced 14 texts (SD = 3) over the two month period. Children were free to write about topics of their own choice. At the start of the intervention stage the examiner taught the children to use their letter-sound knowledge to produce invented spelling (see above).

Because we did not expect the stimulated strategy (invented spelling) to be reversible (that is, children may not have been inclined to drop this strategy, even after it was no longer being promoted by an adult) a ***multiple-baseline design across individuals*** was used (Kucera & Axelrod, 1995). However, this design's internal validity might have been disrupted by other events occurring during the second month, such as changes in the classroom program that might lead to changes in children's writing forms. To avoid this problem, the case studies were begun on a ***staggered*** schedule. In each classroom the four studies were started with intervals of about two weeks between them, and finished in the same order as they started. Thus, in both classrooms the first child started and finished about 6 weeks before the fourth child.

Procedure. The children sat at a special table in their classroom. The other students were active in other corners and play centers of the classroom while the focal children worked on their own, with coaching from their teachers (co-authors of the present article). The writing sessions were videotaped. After the children had finished story writing, they re-read their stories to their teacher. These re-readings were audiorecorded in one classroom and videotaped in the other.

In neither series did we have the impression that children met our invitations to write a text "their own way" with hesitation, frustration, or refusals. Nor did the children say that they could not read their writing because it "didn't say anything." The stories that they "read" to the examiner were narrative or expository texts, suggesting that they understood the task.

Coding the texts. As means of judging children's writing forms, we used the children's text, their transcribed re-readings of the text, and the observations during the creation of text (available in the form of examiner's records or videotapes). To test which combinations of writing had occurred, we coded every single pseudo-cursive scribble, letter, pseudo-letter, or other sign. Each sign was coded as "scribble," "well-learned element," "non-phonetic" or "invented spelling," taking into account how children had behaved as they wrote their text and how they re-read it. Thus we were able to estimate the proportions of various writing forms in a single text.

- Signs were coded as *pseudo-cursive scribble* when writing involved the production of more or less wavy lines imitating handwriting. The number of uninterrupted scribbled lines was tallied.

- Signs were coded as *well-learned elements* when the words were names or words like "dad" and "mom" or words practiced in the classroom. These words were used but not related to the meaning of the story. Children's re-

readings mostly did not include these words. We counted the letters that represented well-learned elements; for instance, if "Thomas" added his name to a number of scribbled lines, then his score on well-learned elements would be a 6.

- Signs were coded as *non-phonetic strings of real letters or pseudo-letters* when children applied some conventions (i.e., a variety of intentionally different forms) but the writing was not systematically rule-based. They mostly re-read the text as a monologue (meaningfully connected clauses) but the letters did not show a phonetic-based relationship with the written story. We counted the number of letters that formed random letter strings. The series of letters hcjAGddcjC under a drawing scored a 10 on letter strings.

- Signs were coded as *invented spelling* if the words were somewhat readable for a person who knew the child's intention. In many cases it was only possible to differentiate between invented spelling and non-phonetic letter strings afterwards, with the help of the video- and audiorecordings of the re-readings. For instance, in the text "ED ZYOIDR" one may not immediately recognize *EenDen Zwemmen In De Rivier* (Ducks swim in the river). We counted the number of letters that composed phonetic representations of words; when phonetic writing only included ED ZYOIDR the child scored an 8 on invented spelling.

Agreements between two independent coders about each form of writing ranged from $r = .83$ (Pearson Correlation coefficient) for invented spelling to $r = .96$ for pseudo-cursive scribbles. For each child and each of the four forms of writing we calculated a mean score per session for the baseline and intervention stages separately.

Additionally, for both stages of the experiment we counted the number of texts with only early-appearing forms of writing (scribbled lines or letter strings sometimes combined with well-learned elements), the number of texts with only invented spelling, and texts combining both forms. Since the baseline and intervention stage included 8 sessions, the maximum score on each of these three variables was 8 for both stages of the experiment. In cases where a lower or higher number of stories was available for one or both series of texts because of missing values or additional writing sessions, the score for eight sessions was calculated mathematically.

Results

Older children did not use more invented spelling but they used less scribble in the baseline stage ($r = -.87$) and more well-known elements in the intervention stage ($r = .73$). The more letters children knew according to a pre-test, the more they were inclined to produce invented spelling in the intervention stage ($r = .74, p < .05$, two-tailed).

In the baseline stage children rarely used phonetic-based, alphabetic writing (see Table 1). According to multiple matched-pair Wilcoxon tests (two-tailed) (Marascuilo & McSweeney, 1977), children used invented spelling less than letter strings ($z = -2.37, p < .05$), scribbles ($z = -2.10, p < .05$), or well-known words ($z = -2.37, p < .05$). Table 2 presents mean numbers of texts with only

early-appearing forms such as scribble and/or random letter strings, only invented spelling, or mixtures of both forms. Six out of 8 children produced texts made up only of early-appearing forms. According to multiple matched-pair Wilcoxon tests (two-tailed), such writings occurred more often than writings made up of exclusively invented spelling ($z = -2.64$, $p < .05$) or mixed forms ($z = -2.64$, $p < .05$).

Table 1: Mean scores on four different forms of writing for sessions without and with modeling of phonetic writing

	TOTAL	WITHOUT MODELING	WITH MODELING
Scribble	8.1(9.2)	13.7(16.6)	2.5(2.6)
Letter strings	30.6(27.8)	37.1(57.6)	18.5(17.4)
Well-learned elements	3.2(0.8)	2.6(1.8)	3.7(2.4)
Invented spelling	2.6(2.2)	0.1(0.1)	5.1(4.3)

Table 2: Mean number (and standard deviations) of texts with only early-appearing forms (scribble, well-learned elements or random letter strings), only invented spelling, or mixed forms

	TOTAL	WITHOUT MODELING	WITH MODELING
Only early forms (scribble, well-learned elements or random letter strings)	9.6(4.1)	6.7(2.5)	2.9(2.0)
Only invented spelling	0.9(1.6)	0.0(0.0)	0.9(1.6)
Mixed forms	4.3(1.3)	0.1(0.3)	4.2(1.3)

According to Wilcoxon's Signed Ranks Test (two-tailed), the amount of invented spelling increased in the intervention stage, $z = -2.52$, $p < .05$. Without exception children then wrote some phonetic-based, alphabetic writing, but mostly in combination with early-appearing forms. According to a matched-pair Wilcoxon test (two-tailed), mixed writings composed of invented-spelling and early-appearing forms occurred more often than writings merely made up of invented spelling, $z = -2.39$, $p < .05$ (see Table 2).

Only three children increased their attempts to write phonetically within the intervention stage. During the first four sessions of the intervention stage children used on average per text 15.5 letters ($SD = 4.9$) to write some invented spelling, and during the last four sessions on average 25.6 ($SD = 34.1$), resulting in a non-significant growth, $z = -.14$, *ns*.

Discussion

A striking result of these studies of eight children writing stories over a two-month period is that almost all products included writing forms such as pseudo-cursive scribble, random letter strings, well-learned elements such as names, or invented spelling. Children may exclusively use merely pictorial forms (drawings) to convey the meaning of their story when asked "to put something down" to convey their message (Martlew & Sorsby, 1995), or

when drawing is promoted as a legitimate form of writing preceding the task.

Without any specific instruction about the form of writing, children preferred forms of writing that look like writing but do not represent sounds. Six out of eight children's products included one or more of the following forms of writing: pseudo-cursive scribble, well-learned elements (such as their name), strings of pseudo-letters, or random letter strings. The other two children wrote a few words in invented spelling over the eight sessions, in addition to one or more of these early-appearing forms.

When adults promoted phonetic-based, alphabetic writing before the sessions, all children represented some spoken language through letters, suggesting that they were aware of the alphabetic principle, but without giving up less mature behaviors such as name writing, pseudo-cursive scribble, strings of pseudo-letters, or random letter strings. The children created forms that represented various aspects of their emerging knowledge and strategies, rather than adopting invented spelling as soon as they began to understand the alphabetic principle. The text in Figure 1 is indicative: it has some invented-spelling in the first sentence, but then goes over to pseudo-cursive scribble. We hypothesize that this child may have continued to explore the early-appearing forms (here pseudo-cursive writing) in addition to invented spelling because the pseudo-cursive writing represented important aspects of writing that would have gotten lost if the text was just written in invented spelling. Unmixed, invented spelling might not have allowed this child to keep up with her notion of how a long written story should look. Given her tendency to produce pseudo-cursive scribble in addition to invented spelling, it appears that she valued concordance between the amount of written and spoken text more highly than the need to represent sounds with alphabetic writing.

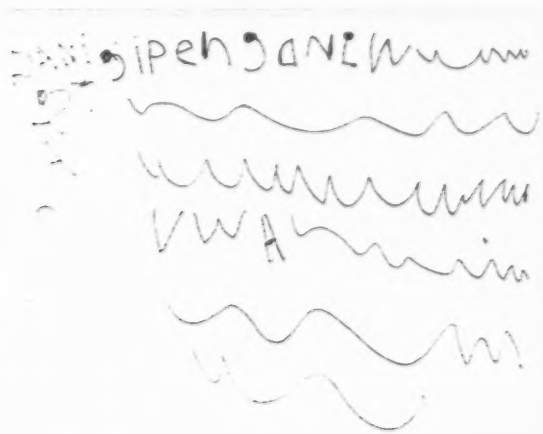

Figure 1: A story by a four-year-old girl, Danitsja, about two main characters from a famous Dutch children's book entitled *Jip* [JIP] *and Janneke* [JANI]

Children more advanced in letter knowledge were inclined to produce invented spelling when they were encouraged to use that letter knowledge. However, almost all children in the younger group used the phonetic-based, alphabetic form of writing sporadically and only when they were encouraged to use letter-sound knowledge, probably because this form interfered too much with other knowledge and strategies. The expectation that a growing share of invented spelling would replace the early written-like forms was not supported by our case studies. Even when young children were aware of the representative function of letters they still preferred to create a writing-like text that did not represent meaning.

One boy, for instance, was aware that letters represent sounds, based on some pieces of invented spelling that he had produced. In spite of this, he mostly preferred random strings of letters, often mixed with pseudo-letters, to express his story. A few times he started with invented spelling but continued with random letter strings. The boy seemed aware of the switch in strategy, as appears from a comment he once made: "Now I do it in my normal way again." Attempts to employ phonetic-based, alphabetic writing may have taken so much effort at the expense of other aspects of story writing conventions that he kept creating his own forms and ignoring his teacher's suggestions. When his teacher continued to encourage invented spelling, he even became active in creating excuses to circumvent phonetic-based, alphabetic writing. He once claimed that his text, composed of non-phonetic letter strings, could only be read with the help of a mirror which was not available. Another time this Dutch boy explained that his text was written in English, and on still another occasion he said that the pseudo-letters in his text represent Martian language that only a few people—including he and his father—could read.

Study II

A second series of case studies was carried out to test the hypothesis that children who are older and more advanced in emergent literacy are more inclined to apply and develop letter-sound knowledge in the context of story writing, whether prompted by adults or not. On average the children in this study were about a year older than those who participated in the first study. About half of the children in this senior group spontaneously used their letter-sound knowledge in a word dictation preceding the experiment.

Another aim of this series was to explore how children's forms of writing differ when they can use the computer as writing tool. McBee (1996) assumes that children may progress more rapidly with the use of technology. The physio-motor development entailed by handwriting may prevent many children from doing much writing until the first or second grade. They may be more inclined to use "easy" forms such as pseudo-cursive scribble. Writing by hand is labor-intensive when one considers not only the physical, but also the mental skills involved.

Method

Subjects. The group was composed of eight senior kindergarten children (mean age: 74 months, range: 70–78 months) from two different schools. The descriptions of the classrooms in Study I apply to these classrooms as well. The classrooms were quite large (about 30 children each). Both schools recruited children from low-SES families with fathers working as manual laborers. The children were on an average level of emergent literacy knowledge compared to the rest of their classroom. In addition to a letter test (pointing at known letters on a card and naming them), the pre-test included the invitation for the children to write all the words they knew, as well as a dictation of eight simple words. All selected children were able to name some letters on the card (ranging from 3 to 16 of 26) and were able to write one or more well-learned words such as "papa," "mama" or "pop" (doll), in addition to their own name. Four of the eight children spontaneously produced invented spelling in some words of the word dictation, i.e., "KS" for kaas (cheese). Three of eight children were boys.

Design. Eight case studies were designed similar to the first study. We used the same instructions preceding the baseline and the intervention stage of the experiment. All eight children wrote stories about twice a week over the course of two months. They produced an average of 15 texts each (SD = 2.2). The children in this study used the computer as the writing tool. The program (Paintbrush) enabled children to draw, color, or use handwriting in addition to the keyboard.

Procedure. An examiner was present during the sessions. She instructed the children and helped them to familiarize themselves with the computer if necessary. All participants had some computer experience in school but none of the children was familiar with Paintbrush. The examiner recorded notes during the sessions, into a more comprehensive journal afterwards. Children's readings of their stories to the examiner were audiotaped. The instructions preceding and within the sessions were similar to those in the first study, except for those information related to the new writing tool. The focal children worked on their own in a special corner while their classmates were active in other corners and play centers of the classroom.

Coding the texts. Because none of the children in this study produced scribbled lines (neither in the word dictation nor when producing stories) we only coded the following categories: well-learned elements, non-phonetic strings of real or pseudo-letters, and invented spelling. The coding was similar to Study I.

Results

The older the children, the less often they tended to produce only early-appearing forms in the intervention stage (r = -.51, p < .1, one-tailed) and the more they tended to produce only phonetic-based, alphabetic writing (r = .55, p < .1, one tailed) or mixed forms (r = .53, p < .1, one-tailed). Letter knowledge did not predict forms of writing, either in the baseline or the intervention stage.

In the baseline stage invented spelling occurred less often (one-tailed tests) than letter strings ($z = -1.82, p < .05$) or well-known words ($z = -1.69$, $p < .05$) (see Table 3). According to matched-pair Wilcoxon tests (two-tailed), children produced more texts made up of only early-appearing forms than texts that only included invented-spelling ($z = -2.41, p < .05$) or a mixture of the two ($z = -1.72, p < .05$); see Table 4. If children had begun to use phonetic-based, alphabetic writing they were more inclined to use this form in combination with early-appearing forms than alone ($z = -1.83, p < .05$).

Table 3: Mean scores on three different forms of writing for sessions without and with modeling of phonetic writing

	TOTAL	WITHOUT MODELING	WITH MODELING
Letter strings	96.0(104.9)	135.0(176.1)	57.0(61.3)
Well-learned elements	6.4(6.0)	8.4(8.4)	4.4(4.1)
Invented spelling	10.0(8.8)	2.9(6.2)	17.2(12.4)

Table 4: Mean number (and standard deviations) of texts with only early-appearing written-like forms (scribble, well-learned elements or random letter strings), only invented spelling, or mixed forms

	TOTAL	WITHOUT MODELING	WITH MODELING
Only early forms (scribble, well-learned elements or random letter strings)	7.6(4.1)	6.2(3.1)	1.4(2.1)
Only invented-spelling	0.8(0.7)	0.1(0.4)	0.6(0.7)
Mixed forms	7.8(3.8)	2.0(2.8)	5.9(1.8)

When phonetic writing was promoted, invented spelling increased. According to Wilcoxon's Signed Ranks Test (two-tailed) the amount of phonetic-based, alphabetic writing increased in the intervention stage, $z = -2.52$, $p < .05$. Children's attempts to write phonetically further increased within the intervention stage. Comparing the first four and last four sessions of the intervention stage, we found that the number of letters used for invented spelling significantly increased, $z = -2.10, p < .05$. During the first four sessions children used an average of 54 letters ($SD = 48$) in their invented spelling; during the last four sessions the average climbed to 80 ($SD = 56$).

Children often used phonetic-based, alphabetic writing in combination with other forms (see Table 4). Similar to the younger sample in Study I, mixtures of invented spelling and early-appearing forms dominated. According to matched-pair Wilcoxon tests (two-tailed), this form was more frequent than texts made up of only invented spelling ($z = -2.53, p < .05$) or early-appearing forms ($z = -2.25, p < .05$).

Discussion

This second series of case studies replicates the finding of the first series: even after kindergartners had started using invented spellings, they almost always continued to include some early-appearing forms of writing in their

products. Even when children had an understanding of the alphabetic principle they often preferred letter strings and well-learned elements to represent their stories over invented spelling.

We hypothesize that children continue to explore early-appearing forms as long as their various sources of knowledge are not fully integrated. Early-appearing forms of writing make it possible to write long stories—a possibility that may be lost once children begin to use invented spelling exclusively. Children often created new mixed forms combining invented-spelling with random letter strings (see Figure 2), presumably to produce a long story.

Written text:

qhenkghhffddfgdfsgvfdsgdfdsgvdsgvdsghgshgsghgffdfdsfgdhfdf
dgdgsdgdgfh

dfgdgjhjfhthtfjulijyuolpu
uyyteryxtioip}pp{iudddiuuuiiyiaaeiurivk

AAIIUntbiv
vmskhghghhliwehglhghlihhghlrhglhglrhrlhglrhjrhlrjlrljr

jaauavobatu uvoutoavtautvutut ttau tau
btauautvtotoutltutututtuyvuyuylyoyouy

bootkikytjjjkykkkkykioiyikiy
iyoyiiyiütyjfoUOEORUELRKRCJhgfgjgj

Yiyyyiygativisnhcjjgjggddthjgfjhhgfgdfhnjkklokkijkn5821d
csrhyjkkg

Interpretation of somewhat readable text:

Henk= own name

Boot=BOOT (boat)

Gativisn=GAAT IE VISSEN (he goes fishing)

Klokkijkn58=KLOK KIJKEN 5 8 (looking at the clock, 5 8)

Re-reading:

This story is about Henk. Henk went to find his father. He took his controllable car and his tractor. Those he took with him. His brother and sister joined him. They went together. When they arrived at the boat they jumped in. And they made a tour. And Henk went fishing. And then he looked at the clock. It was five to eight. And then they went home. It was almost dark.

Figure 2: A text written with the computer and the re-reading of the text

These case studies also support the hypothesis that children may not value invented spelling more than a writing-like format because they do not consider text as the sole means to reconstruct their stories. Children often reread their stories without paying attention to the text, by telling a story that

covered some words in the written text, while ignoring others and adding still others not present in the written text. Compare the written and oral text in Figure 3.

Written text:

vekasi visbot kees dirtijn liw hjtijgrs

aefyju54

aakjhyyy

Interpretation:

vekasi=VAKANTIE (vacation)

visbot=VISBOOT (fishing boat)

kees=own name

dirtijn=DIERENTUIN (zoo)

liw=LEEUW (lion)

hj=HAAI (jaw)

tijgrs=TIJGERS (tigers)

Oral text:

On vacation. I went on vacation. I went, no, I went in a boat, no fishing on a boat. I like that very much, together with Henk and his father. And what is so nice, well it is nice. We crossed the water to go to the zoo.

(Underlined words are part of the written text.)

Figure 3: A text including some invented spelling that is only partly re-read.

In contrast to the first series of case studies, in which most children returned to early developed forms after a few sessions, the children in the senior group continued to apply their letter-sound knowledge after the form was modeled. This difference between the outcomes of the two series suggests that children need some fluency in applying their letter-sound knowledge before they are willing to explore the use of invented spelling to write stories. The children in this series were older than the ones in the first study and more aware of the alphabetic nature of writing. More children in the second group spontaneously produced invented spelling in a word dictation preceding the experiment than did members of the first group.

Study II supports the expectation that early-appearing forms such as letter strings are replaced by invented spelling and conventional writing as children's knowledge of invented spelling grows. Results of their attempts to write phonetically are also more in accordance with their knowledge of how writing looks. When the children became more fluent in producing invented spelling (as indicated by the amount of invented spelling produced

during a writing session), random letter strings—the most prominent form during the first eight sessions—became less prominent.

In sum, story writing does not seem to promote a shift from early-appearing forms of writing to phonetic-based, alphabetic writing; however, text writing may encourage children to practice invented spelling once they have reached some level of fluency in its production and are stimulated to use this knowledge (Richgels, 1995).

In many respects the outcomes for this series of computer studies are similar to the outcomes for the paper and pencil studies. In writing with the computer, children explored similar forms and combinations of forms, with the exception of scribble. While they could scribble with the computer (by writing their name with the mouse or making drawings), they did not. Letters are easy to produce and seem to be preferred when the computer is used as a writing tool. This result is consistent with a series of studies carried out by Sulzby and colleagues (Lomangino, Nicholson, & Sulzby, 1999; Nicholson, Lomangino, Young, & Sulzby, 1998; Olson & Sulzby, 1991; Sulzby, Olson, & Johnston, 1989). However, the fact that the computer group produced no scribbling during the paper and pencil word dictation preceding the experiment would lead to the conclusion that age, not the writing tool, was responsible for their inclination to produce letter forms. Direct comparisons in different age ranges are needed to understand the effect of the writing tool on forms and strategies.

Story writing: a tool to stimulate young children's literacy?

Story writing activities teach kindergartners a great deal about literacy, in ways that do not look much like traditional elementary school instruction (Joint Position Statement, 1998). The two series of case studies show that story writing provokes young children to struggle to integrate various facets of their knowledge about writing. The present finding—that even more advanced children continued to apply early-developed forms, often ignoring their phonetic knowledge (Brenneman, Massy, Machado, & Gelman, 1996)—proves that kindergartners face this same struggle. Children do not discard early-developed understandings about writing, such as the need for concordance between the length of an oral story and the length of their written version, in favor of other qualities positively rated by adults, such as readability. As long as early-appearing forms such as pseudo-cursive writing or letter strings offer advantages not available to children through their limited invented spelling skills, then children produce a variety of forms, even when the teacher privileges invented spelling strategies. Not until children have some fluency in producing invented spelling will story writing provoke the production of text in invented spelling form.

We hypothesize that the struggle to integrate writing qualities that are present in early- and later-appearing forms may advance children's understanding. For instance, early-appearing qualities such as long strings of letters or long scribbles to represent a story may support an active search for letters other than the few they are able to hear in words during the beginning stages of invented spelling. Young children's knowledge of the written form may thus help them to expand their alphabetic knowledge when they

produce text in invented spelling (Ehri & Wilce, 1987, Richgels, 1995). In other words, the creative process of integrating developing facets of writing, probably motivated more by story writing than by word writing or copying intentions, may help drive the development of phonetic skills (Levin, Korat, & Amsterdammer, 1996).

It is important that teachers and special educators take early-appearing forms of writing into account as part of the developmental process and not just focus on invented spelling. Findings like those reported here are at the heart of theories of emergent literacy, for they suggest that children's emerging knowledge about writing is characterized more by a process of gradual integration of various facets than by a strict process of replacement.

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About CIERA

The Center for the Improvement of Early Reading Achievement (CIERA) is the national center for research on early reading and represents a consortium of educators in five universities (University of Michigan, University of Virginia, and Michigan State University with University of Southern California and University of Minnesota), teacher educators, teachers, publishers of texts, tests, and technology, professional organizations, and schools and school districts across the United States. CIERA is supported under the Educational Research and Development Centers Program, PR/Award Number R305R70004, as administered by the Office of Educational Research and Improvement, U.S. Department of Education.

Mission. CIERA's mission is to improve the reading achievement of America's children by generating and disseminating theoretical, empirical, and practical solutions to persistent problems in the learning and teaching of beginning reading.

CIERA Research Model

The model that underlies CIERA's efforts acknowledges many influences on children's reading acquisition. The multiple influences on children's early reading acquisition can be represented in three successive layers, each yielding an area of inquiry of the CIERA scope of work. These three areas of inquiry each present a set of persistent problems in the learning and teaching of beginning reading:

CIERA INQUIRY 1
Readers and Texts

Characteristics of readers and texts and their relationship to early reading achievement. What are the characteristics of readers and texts that have the greatest influence on early success in reading? How can children's existing knowledge and classroom environments enhance the factors that make for success?

CIERA INQUIRY 2
Home and School

Home and school effects on early reading achievment. How do the contexts of homes, communities, classrooms, and schools support high levels of reading achievement among primary-level children? How can these contexts be enhanced to ensure high levels of reading achievement for all children?

CIERA INQUIRY 3
Policy and Profession

Policy and professional effects on early reading achievement. How can new teachers be initiated into the profession and experienced teachers be provided with the knowledge and dispositions to teach young children to read well? How do policies at all levels support or detract from providing all children with access to high levels of reading instruction?

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